

Your Only Human

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“The human is the weakest link.” This statement often can be heard when people describe accidents of any sort. Given the complexity of the machinery and computer technology that make up today’s aircraft, it’s mind-bending to think humans would be the weakest link. Surely components will break and computers will fail more than an aircrew! On the other hand, could it be that machine parts and computer processes perform consistently, whereas humans are more easily affected by situations, environments and personal factors? This is a question that plagues the field of human factors.

The Army Aviation environment is ripe for human error due to such factors as operational tempo and the addition of advanced technology in the cockpit. For example, modern aircraft with multifunction displays often have increased capabilities over their traditional counterparts (e.g., map displays vs. kneeboards and paper maps). This increase in functionality might not only increase the amount of information available to aviators in the cockpit, but also the missions and tasks they are responsible for while in flight. The addition of functions and tasks requires pilots to spend more time managing the aircraft as opposed to flying it.

Essentially, the more time pilots need to spend inside the cockpit managing the aircraft and flight systems, the less time and attention they have to direct toward keeping the aircraft in flight and away from obstacles. Increased heads-down time in the cockpit can significantly impair pilots’ abilities to maintain situational awareness and properly coordinate their and their crew’s actions. The combination of these factors might lead to increased aircraft accidents due to human error.

Within the aviation realm, it’s common to hear the statistic that 80 percent of accidents are due to human error. In fact, there are whole divisions of researchers working on these questions, trying to determine the incidence of human error, the best way to classify accidents and how to catalog human error in these accidents. The reason for this push is the need to learn from past mishaps to improve risk management and reduce the potential for future accidents. To state the obvious, the Army is very concerned with risk management and the reduction of accidents. After all, you’re reading this magazine, which is published by the U.S. Army Combat Readiness Center!

While the USACRC is the organization primarily responsible for accident investigations and analysis, the information gathered by their investigators is useful for many in the human factors field. Their Risk Management Information System Web site provides information regarding accident rates and statistics as well as details about accident causes and recommendations. Researchers use this information to answer some human factors questions.

There are several frameworks used by different organizations and researchers to evaluate accidents and their causes. Before getting to the big questions regarding human error in Army Aviation accidents, let’s review a few facts about accident data. We all know that aviation accidents can be called flight, flight-related or ground accidents depending on their circumstances and are classified according to



their severity as Class A, B, C, D or E. Accident investigators determine the causes (environment, materiel or human error) of each accident to answer the question of what happened. Investigators also evaluate system inadequacies or root causes in each accident to determine why the accident happened. This additional classification allows for a more detailed understanding of hazards present in aviation operations.

The system inadequacies or root causes considered include support, standards, training and leader and individual failures. Of course, many accidents have more than one causal factor and multiple root causes. For our current purposes, we're interested in examining human error more closely and also looking specifically at individual failures present in those human error accidents.

One important question in analyzing Army Aviation safety is, "How often is human error a cause of accidents?" However, acknowledging the presence of human error is merely the first step. A more complete understanding can be developed only when looking at the root causes of accidents. Many accidents have several root causes, all of which are important. Yet the individual failure category contains failures that are tied directly to the crewmembers and are most typical when thinking about human error. Some of these individual failures include overconfidence, complacency, crew coordination lapses, crew issues and distraction due to high workload. While it's not possible in the space allotted here to define every possible individual failure, here are a few descriptions and examples.

Overconfidence and complacency

These two attitudes often are found in similar situations. They're both tied to an individual's confidence in himself, his crew, his aircraft or his ability to handle situations and can result in poor decisions while in flight. Pilot confidence is a very good thing; however, in Army Aviation, the saying "You can't have too much of a good thing" isn't always the case. A common example of overconfidence is continued flight in decreasing weather, which often leads to problems.

Crew coordination

Thankfully, much attention and training have been geared toward improving crew coordination. The ability of crewmembers to distribute workload while flying and accomplish their missions is dependent upon their ability to communicate effectively. Unfortunately, there are other less-known crew issues that can adversely affect crew coordination.

Crew issues

The makeup of an aircrew can be an important factor in crew coordination. How often have you heard of situations where a student pilot said he assumed the instructor pilot had the controls or knew what he was doing? What about times when there are experience or rank differences in the cockpit? Is it possible student pilots and junior officers are reluctant to question their co-pilots' actions, thus hampering crew coordination? In fact, accident investigators have found that oftentimes a pilot's confidence in his IP or higher-ranking co-pilot can hinder communication. For example, a pilot might refrain from providing obstacle clearance details because he thinks the other pilot's experience means he doesn't need assistance. However, because there had been a communication breakdown, what the pilots in these situations didn't know was their experienced co-pilot was involved with other tasks and needed their input.



Distraction due to workload

Workload in aviation operations is often high, especially with the technological advancements of recent years. The susceptibility to distraction while flying is always a great risk and a major contributor to individual failures. The need to maintain attention outside the aircraft is in conflict with the time taken to manage flight tasks with attention inside the aircraft. A brief review of accident findings shows that division of attention is extremely important. For example, in one accident the findings included statements that “both crewmembers were focused inside the cockpit” and “failure to effectively divide cockpit duties.” Another accident with a completely different flight scenario was found to be the result of “attention diverted inside the cockpit” and “both of the crewmembers had focused their attention inside the aircraft.” As you can see, these very similar findings indicate improper management of workload and cockpit attention is an important and common individual failure.

These individual failure descriptions are examples of how crewmember actions and attitudes can affect human error in Army Aviation accidents. You might be wondering how commonly individual failures actually are identified in the accident database. As it turns out, when looking at any given sample of aviation accidents within the last 15 or so years, we see individual failures are identified in 84 to 92 percent of accidents classified as having a human error component.

This is not to say only individual failures are present. These numbers indicate at least one individual failure was identified by either the accident investigators or the author’s research team; many of the accidents had a combination of failures including support, standards, training and leader failures. Nonetheless, it’s important to remain aware of the importance of workload management, crew coordination and aircrew attitudes such as complacency and overconfidence to increase Army Aviation safety.